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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/810,715

03/29/2004

Yuusuke Sato

251072US3RD

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06/04/2008

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EXAMINER

LEWIS, BEN

ART UNIT

PAPER NUMBER

1795

NOTIFICATION DATE

DELIVERY MODE

06/04/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<p align="center"><b>Advisory Action</b> <b>Before the Filing of an Appeal Brief</b></p>	<p><b>Application No.</b> 10/810,715</p>	<p><b>Applicant(s)</b> SATO ET AL.</p>	
	<p><b>Examiner</b> Ben Lewis</p>	<p><b>Art Unit</b> 1795</p>	

**--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

THE REPLY FILED 13 March 2008 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:

- a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.  
b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on \_\_\_\_\_. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

#### AMENDMENTS

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because  
(a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);  
(b) ☐ They raise the issue of new matter (see NOTE below);  
(c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or  
(d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: \_\_\_\_\_. (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).  
5. ☐ Applicant's reply has overcome the following rejection(s): \_\_\_\_\_.  
6. ☐ Newly proposed or amended claim(s) \_\_\_\_\_ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).  
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☒ will not be entered, or b) ☐ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.  
The status of the claim(s) is (or will be) as follows:  
Claim(s) allowed: \_\_\_\_\_.  
Claim(s) objected to: \_\_\_\_\_.  
Claim(s) rejected: 1, 7-11 and 24.  
Claim(s) withdrawn from consideration: \_\_\_\_\_.

#### AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).  
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).  
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

#### REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because:  
See Continuation Sheet.  
12. ☐ Note the attached Information *Disclosure Statement*(s). (PTO/SB/08) Paper No(s). \_\_\_\_\_.  
13. ☐ Other: \_\_\_\_\_.

/PATRICK RYAN/  
Supervisory Patent Examiner, Art Unit 1795

Continuation of 11. does NOT place the application in condition for allowance because: Applicants disagree with the underlying presumption in the rejection under 35 USC 103(a) combining Okamoto with Muller and Pan (and others) because the combination of art does not provide any suggestion for the claimed fuel components in the ratios defined in a fuel cell also including a reformer and indeed provide no indication as to how DME contributes to the reforming reaction in the fuel cell. That the art does not provide the requisite disclosure that would lead one to the claimed invention, the claims cannot be considered obvious. However, presuming that the Office sticks to the rationale alleged in the rejections, there is nothing in what has been cited in the rejection that minimizes or contradicts the Applicants surprising findings for the claimed fuel, in the claimed mixing ratio, in the type of fuel cell being claimed. Thus, the claims would not have been obvious as the combination defined in the claims yields more than "a predictable result." (see KSR Intern. Co. v. Teleflex, Inc., 127S.Ct. 1727 (2007)).

In response, Examiner notes that Okamoto et al as modified by Muller et al. and Pan et al. differs from Applicant's claims in that Okamoto et al. as modified by Muller et al. and Pan et al. do not disclose wherein the mixing ratio of dimethyl ether and water is in a range of 1:3 and 1:4. However, Muller et al. recognize the need to increase the concentration of dimethyl ether in a dimethyl ether, methanol and water mixture. Muller et al. teach that If methanol/DME/water fuel streams are employed, it might be desired to increase the DME concentration during low fuel cell loads in order to obtain higher efficiency (Col 5 lines 60-67). . Therefore, it would have been within the skill of the ordinary artisan to adjust the DME/ water ratio in the methanol/DME/ water mixture of Okamoto et al. as modified by Muller et al. and Pan et al. such that the DME/water ratio is within the applicants claimed DME/water ratio range in order to obtain higher efficiency during low fuel cell loads. Discovery of optimum value of result effective variable in known process is ordinarily within skill of art. In re Boesch, CCPA 1980, 617 F.2d 272, 205 USPQ215

Furthermore, with respect to the combination of the Okamoto and Pan references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it would have been obvious to one of ordinary skill in the art to incorporate the dimethyl ether of Muller et al. as a fuel in the fuel cell system of Okamoto because Muller et al. teach that particularly at low current densities, a direct dimethyl ether fuel cell may show efficiency advantages over other fuel cell types. For instance, an efficiency advantage may be obtained over direct methanol fuel cells (Col 4 lines 7-22).

First, the type of Muller et al.'s and Pan's fuel cell are completely different from the one defined in the claims, i.e. Muller's fuel cell and Pan's fuel cell are "direct dimethyl ether fuel cell" which do not include a reformer. As Muller et al. do not teach or suggest the reformer, one of ordinary skill in the art would not recognize how DME contributes to the reforming reaction in the Applicant's reformer and therefore Muller does not provide any of the requisite teachings that would lead one to (A) include DME in the type of fuel cell claimed; nor (B) adjust the mixing ratio of DME and water because the mechanism of steam reforming of higher hydrocarbons (such as DME) is more complex.

In response to applicant's argument that "the type of Muller et al.'s and Pan's fuel cell are completely different from the one defined in the claims", examiner notes that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). It would have been obvious to one of ordinary skill in the art to incorporate the dimethyl ether of Muller et al. as a fuel in the fuel cell system of Okamoto because Muller et al. teach that particularly at low current densities, a direct dimethyl ether fuel cell may show efficiency advantages over other fuel cell types. For instance, an efficiency advantage may be obtained over direct methanol fuel cells (Col 4 lines 7-22). Examiner notes that Muller et al. was used to show that it would have been obvious to one of ordinary skill in the liquid fuel cell art to use dimethyl ether fuel in the system of Okamoto (which has a reformer). Examiner relied on Muller et al. for the teaching of the use of dimethyl ether as a fuel for fuel cells.

What about Pan which is cited for the amount of methanol and to optimize fuel compositions depending on use (see page 4 of the Action, last paragraph)? As already noted, Pan's fuel cell is different than that which is claimed and therefore what is applicable in Pan's fuel cell is not necessarily so for other fuel cells, like that in Okamoto or that in the claims. Moreover, Pan et al.'s fuel cell type is completely different from Applicant's fuel cell type. Pan et al. merely disclose a type of "direct fuel cell" which does not include a "reformer"

In response to applicant's argument that "the type of Muller et al.'s and Pan's fuel cell are completely different from the one defined in the claims", examiner notes that the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See In re Keller, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). It would have been obvious to one of ordinary skill in the art to incorporate the dimethyl ether of Muller et al. as a fuel in the fuel cell system of Okamoto because Muller et al. teach that particularly at low current densities, a direct dimethyl ether fuel cell may show efficiency advantages over other fuel cell types. For instance, an efficiency advantage may be obtained over direct methanol fuel cells (Col 4 lines 7-22). Examiner notes that Muller et al. was used to show that it would have been obvious to one of ordinary skill in the liquid fuel cell art to use dimethyl ether fuel in the system of Okamoto (which has a reformer). Examiner relied on Muller et al. for the teaching of the use of dimethyl ether as a fuel for fuel cells.